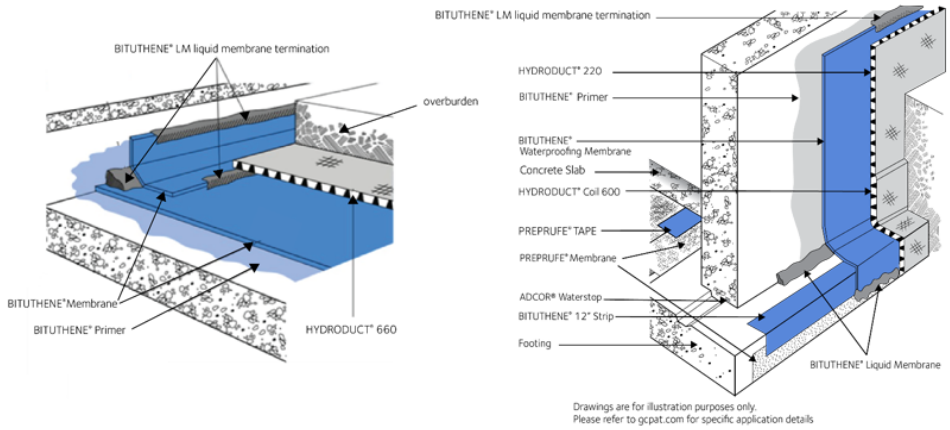
BITUTHENE® 4000 System

Membrane and Surface Conditioner System

Product Description

GCP Applied Technologies' ("GCP") BITUTHENE® 4000 system combines a robust, flexible, pre-formed membrane made of a high performance, cross laminated, HDPE carrier film with a tacky, self-adhesive rubberized asphalt compound and BITUTHENE® 4000 surface conditioner.

BITUTHENE® 4000 surface conditioner is water-based primer that is specifically formulated to promote adhesion by binding dust and concrete efflorescence to help provide a suitable surface for the BITUTHENE® 4000 waterproofing membrane. For convenience, BITUTHENE® 4000 surface conditioner is packaged inside each roll of BITUTHENE® 4000 membrane.



Product Advantages

- Provides a barrier to water, moisture and gas — physically isolating the structure from the surrounding substrate
- Excellent adhesion — Special adhesive compound engineered for use with BITUTHENE® 4000 surface conditioner
- Cross-laminated, high density polyethylene carrier film provides high tear strength, puncture and impact resistance
- Cold applied — Simple application to substrates, including low temperature applications
- Reduced inventory and handling costs due to the inclusion of primer in the packaging
- Wide application temperature range — Excellent bond at temperatures as low as 25°F (-4°C)
- Designed to accommodate a wide range of building configurations and details
- RIPCORD® integrated filament —Split release on demand feature allows for ease of installation in detailed areas

System Components

Membrane

BITUTHENE® 4000 membrane – Self-adhered, rubberized asphalt waterproofing membrane

Ancillary components (Data sheets for all system components are available at gcpat.com.)

- BITUTHENE® 4000 surface conditioner – Water-based latex primer adhesive with added alcohol to allow application at low temperatures
- BITUTHENE® B2 LVC adhesive primer - Low VOC, solvent-based primer to increase adhesion of the BITUTHENE® 4000 membrane to concrete surfaces
- BITUTHENE® LM liquid membrane – Two-component, elastomeric, liquid-applied detailing compound
- BITUTHENE® mastic – Rubberized, asphalt-based mastic
- PREPRUFE® Detail Tape – Double-sided self-adhesive tape
- HYDRODUCT® drainage composite – High impact and creep-resistant geo-composite and protection layer
- BITUTHENE® Deck Prep surface treatment – Surface leveler for application to uneven or rough concrete surfaces

Limitations of Use

- The BITUTHENE® 4000 membrane and BITUTHENE® 4000 surface conditioner are specifically designed for use as detailed in this product data sheet, and are not intended for any other use. Contact GCP Technical Support if any other use is anticipated or intended.
- The BITUTHENE® 4000 membrane is designed for waterproofing surfaces where in-service temperatures will not exceed 130°F (54°C).
- Do not use BITUTHENE® mastic to terminate the BITUTHENE® 4000 membrane to PREPRUFE® pre-applied waterproofing systems. Terminations to PREPRUFE® membranes should only be done with BITUTHENE® LM liquid membrane.

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Safety and Handling Information

Read and understand the product label and safety data sheet (SDS) for each system component. All users should acquaint themselves with this information prior to working with the products and follow the precautionary statements. SDSs can be obtained by contacting your local GCP representative or office, by calling GCP toll free at 1-866-333-3SBM (3726) and in some cases from our website at gcpat.com.

Storage

All BITUTHENE® 4000 membranes can be stored horizontally inside the box. Storage temperatures should not be below 25°F (-4°C) and should not exceed 90°F (32°C).

Installation

Technical Support, Details, and Technical Letters

The most up-to-date detail drawings and technical letters are available at gcpat.com. For complete application instructions, please refer to the current GCP Applied Technologies Contractor Handbook and Literature at www.gcpat.com. Documents in hardcopy as well as information found on websites other than www.gcpat.com may be out of date or in error. Before using this product, it is important that information be confirmed by accessing www.gcpat.com and reviewing the most recent product information, including and not limited to product data sheets and contractor manuals, technical bulletins, detail drawings and detailing recommendations. Please review all materials prior to installation of BITUTHENE® 4000 membranes. For technical assistance with detailing and problem solving, please call toll-free at (866) 333-3SBM (3726).

Temperature

- Apply BITUTHENE® 4000 membranes and BITUTHENE® surface conditioner only in dry weather and when air and surface temperatures are 25°F (-4°C) or above.
- BITUTHENE® B2 LVC adhesive primer and BITUTHENE® 4000 surface conditioner should only be applied in dry weather when the temperature is above 25°F (-4°C). See separate product information sheets and applicable application instructions.

Surface Preparation

Surfaces must be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Concrete must be properly cured (minimum seven-days for normal weight structural concrete and 14 days for lightweight structural concrete). For horizontal applications, double the above cure times of concrete if placed over non-vented decks. Certain conditions, such as unusually wet weather or late removal of forms, may require longer dry times.

Dry weather application of BITUTHENE® 4000 membranes and BITUTHENE® 4000 surface conditioner is preferred. On vertical applications, if time is critical and damp conditions are unavoidable, BITUTHENE® B2 LVC adhesive primer may be used in place of BITUTHENE® surface conditioner. The use of BITUTHENE® B2 LVC adhesive primer may allow priming and installation of BITUTHENE® 4000 membranes on damp surfaces or green concrete. When using BITUTHENE® B2 LVC adhesive primer, priming may begin as soon as the concrete will maintain structural integrity.

Only use form release agents that will not transfer to the concrete. Remove forms as soon as possible from below horizontal slabs to prevent entrapment of excess moisture. Excess moisture may lead to blistering of the membrane.

Cure concrete with clear, resin-based curing compounds that do not contain oil, wax or pigment. See Technical Letter 5, Curing Compounds and Form Release Agents. Before application of BITUTHENE® surface conditioner and BITUTHENE® 4000 membranes, allow concrete to thoroughly dry following any rain (except with BITUTHENE® B2 LVC adhesive primer as noted above). Do not apply any products to frozen concrete.

Repair substrate defects such as spalled or poorly consolidated areas. Remove sharp protrusions and form match lines. For rough or uneven deck surfaces, use BITUTHENE® Deck Prep surface treatment as a repair and leveling agent. See BITUTHENE® Deck Prep surface treatment product information sheet for details. On masonry surfaces such as rough concrete block and brick walls, apply a parge and trowel cut mortar joints flush to the face of the concrete blocks and bricks.

Surface Conditioning

BITUTHENE® 4000 surface conditioner is ready to use, and can be applied by spray or roller. For best results, use a pump-type air sprayer with a fan tip nozzle. Apply BITUTHENE® 4000 surface conditioner to clean, dry, frost- free surfaces at a coverage rate of 300 ft^2/gal (7.4 m^2/L). Coverage should be uniform. The surface conditioner should not be applied so heavily that it puddles or runs. Do not apply conditioner directly to BITUTHENE® 4000 membranes. Allow BITUTHENE® 4000 surface conditioner to dry until the substrate returns to its original (dry) color. At low temperatures or in high humidity conditions, dry time may be extended to greater than one hour.

BITUTHENE® 4000 surface conditioner is clear when dry and may remain slightly tacky. In general, conditioning should be limited to what can be covered within 24-hours. In situations where long dry times may prevail, substrates may be conditioned up to 24-hours in advance. Substrates must be reconditioned if dirt or dust accumulates on the conditioned surface. Tools should be cleaned with water before the surface conditioner dries.

Application on Horizontal Surfaces

Note: PREPRUFE® 300R and 300R Plus pre-applied membranes are strongly recommended and are the preferred products for below slab applications or for any application where the membrane is applied before concrete is poured. See PREPRUFE® membrane waterproofing product information sheets at gcpat.com.

All horizontal surfaces to receive BITUTHENE® 4000 membranes should be sloped to drain at least 1/8 in./ft. (11 mm/m). When a minimum slope of 1/8 in. /ft. (11 mm/m) cannot be achieved, two layers of BITUTHENE® 4000 membranes or 80-mils of BITUTHENE® Deck Prep surface treatment and one layer of BITUTHENE® 4000 membranes maybe an option. Contact your local GCP representative for more details.

Apply the membranes from the low point to the high point so that laps shed water. Overlap all seams at least 2.5 in. (65 mm). Stagger all end laps. Roll the entire membrane firmly, and completely as soon as possible. Use a linoleum roller or standard water-filled garden roller less than 30 in. (760 mm) wide, weighing a minimum of 75 lbs (34 kg) when filled. Cover the face of the roller with a "conforming" material such as 1/2 in. (13 mm) plastic foam sheeting or two wraps of indoor-outdoor carpet to allow the membrane to fully contact the primed substrate. Seal all T-joints and membrane terminations with BITUTHENE® LM liquid membrane by the end of the day of membrane application.

Application on Vertical Surfaces

Apply BITUTHENE® 4000 membranes in lengths up to 8 ft (2.5 m). Overlap all seams at least 2.5 in. (65 mm). On walls higher than eight feet, apply membranes in two or more "shingled" lifts, with the upper sheet overlapping the lower by at least 2.5 in. (65 mm). Roll all membranes with a hand roller.

Terminate the membranes at grade level. Press each membrane firmly to the wall with the butt end of a hardwood tool such as a hammer handle or secure into a reglet. Failure to use heavy pressure at terminations can result in a poor seal.

All top-of-wall terminations should be sealed with BITUTHENE® LM liquid membrane or BITUTHENE® mastic. A termination bar may be used to ensure a tight seal. If the wall has been only partially covered by the end of the working day, apply a maximum ¼" bead of BITUTHENE® mastic tooled thin or BITUTHENE® LM liquid membrane along the exposed edges of the membrane at its temporary terminations to prevent vertical drainage of precipitation, which could undermining the membrane adhesion. Terminate the membranes at the base of the wall if the bottom of the interior floor slab is at least 6 in. (150 mm) above the footing.

Otherwise, use appropriate inside corner detail where the wall and footing meet. A 1/8 in. (3 mm) x 1 in. (25 mm) aluminum termination bar aligned with the top of the membrane is recommended for terminations on CMU, in earth covered decks and in earth-bermed applications where soil cannot be fully compacted. See technical letter 26 about BITUTHENE® membrane terminations for additional information.

Membrane Repairs

Patch tears and inadequately lapped seams with additional membrane. Clean any damaged membrane with a damp cloth and dry. Slit fish-mouths and repair with a patch extending 6 in. (150 mm) in all directions from the slit, and seal edges of the patch with BITUTHENE® LM liquid membrane. Inspect all membranes thoroughly before covering, and repair any damaged areas.

Drainage

HYDRODUCT® drainage composites are recommended for both active drainage and protection of the membranes. See HYDRODUCT® drainage composite product data sheet at gcpat.com.

Insulation

Always apply BITUTHENE® 4000 membranes directly to primed or conditioned structural substrates. Insulation, if used, must be applied over the membranes. Do not apply BITUTHENE® membranes over insulation or lightweight insulating concrete.

Flood Testing (Horizontal Surfaces Only)

Flood test all horizontal applications with a minimum 2 in. (51 mm) head of water for 24-hours. Mark any leaks and repair when the membrane is dry. Before flood testing, be sure the structure will withstand the dead load of the water. For highly sloped decks, segment the flood test to avoid excessively deep water near drains. Conduct the flood test 24-hours after completing the application of BITUTHENE® 4000 membranes. Immediately after flood testing is completed and all necessary repairs have been made, install HYDRODUCT® drainage composite to protect the BITUTHENE® membranes from damage by other trades.

As an alternate to flood testing, appropriate electronic leak detection may be used to check the integrity of the system.

Protection of Membrane

To prevent damage from other trades, construction materials or backfill, protect BITUTHENE® 4000 membranes immediately after application. To avoid potential blisters, place protection immediately where temperatures are above 77°F (25°C).

- On vertical applications, use HYDRODUCT® 220 drainage composite. Adhere HYDRODUCT® 220 Drainage Composite to membranes with PREPRUFE® Detail Tape. Alternative methods of protection are to use nominal 1.0 lb/ft^3 (16kg/m^3), min. 1 in. (25 mm) extruded polystyrene or min.1/4 in. (6 mm) asphaltic hardboard. Such alternatives do not provide positive drainage to the system. If 1/4 in. (6 mm) extruded polystyrene protection board is used, backfill must not contain sharp rock or aggregate over 2 in. (50 mm) in diameter or any debris that might puncture the protection board and/or the membranes. See Technical 27 Letter Protection Courses used with GCP Waterproofing Systems for additional information.
- On horizontal applications, use HYDRODUCT® 660 Drainage Composite. Alternate methods of protection are to use 1 in (25 mm) extruded polystyrene or ¼" asphaltic hardboard.

Placing Steel

On horizontal applications when placing steel over properly protected membranes, use concrete bar supports (dobies) or chairs with plastic tips or rolled feet to prevent damage from sharp edges. Use special care when using wire mesh, especially if the mesh is curled.

Backfill

Place backfill as soon as possible. (See Protection of Membrane above) Use care during backfill operation to avoid damage to the waterproofing system. Follow generally accepted practices for backfilling and compaction. Backfill should be added and compacted in 6 in. (150 mm) to 12 in. (300 mm) lifts.

Approvals

- City of Los Angeles Research Report RR 24386 Miami-Dade County Code Report NOA 18-1109.01
- U.S. Department of Housing and Urban Development (HUD) HUD Materials Release 628j
- BITUTHENE® 4000 membranes carry a Underwriters' Laboratory Class A Fire Rating (Building Materials Directory (File TFGU.R7910) when used in either of the following constructions:
  - Limited to noncombustible decks at inclines not exceeding 1/4 in. (6 mm) to the horizontal 1 ft (0.3 m). One layer of BITUTHENE® waterproofing membrane, followed by one-layer of 1/8 in. (3 mm) protection board, encased in 2 in. (50 mm) minimum concrete monolithic pour.
  - Limited to noncombustible decks at inclines not exceeding 1/4 in. (6 mm) to the horizontal 1 ft (0.3 m). One layer of BITUTHENE® waterproofing membrane, followed by one layer of DOW styrofoam PD insulation board [2 in. (50 mm) thick]. This is covered with one layer of 2 ft x 2 ft x 2 in. (0.6 m x 0.6 m x 50 mm) of concrete paver topping.

Physical Properties for BITUTHENE® 4000 Membrane

PROPERTY	TYPICAL VALUE	TEST METHOD
Color	Dark gray-black	
Dimensions	3 ft x 66.7 ft roll (200 ft^2)	
Thickness	60 mils (1.5 mm) nominal	ASTM D3767—method A
Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)	Unaffected	ASTM D1970
Tensile strength, Membrane, die C	325 psi (2240 kPa) minimum	ASTM D412[1]
Tensile strength, film	5,000 psi (34.5 MPa) minimum	ASTM D882[1]
Elongation, ultimate failure of rubberized asphalt	300% minimum	ASTM D412[1]
Crack cycling at -25°F (-32°C), 100 cycles	Unaffected	ASTM C836
Lap shear	20 lbs (89 N)	ASTM D1002[2]
Peel strength	11 lbs/in. (1926 N/m)	ASTM D903[4]
Puncture resistance, Membrane	50 lbs (222 N) minimum	ASTM E154
Resistance to hydrostatic head	230 ft (70m) of water	ASTM D5385
Permeance	<0.1 perms	ASTM E96, section 12—water method
Water absorption	<0.1%	ASTM D570

Footnotes:

1. The test is run at a rate of 2 in. (50 mm) per minute.
2. The test is conducted at a speed of 4 in. (102 mm) per minute.
3. Individual Roll Length may vary +/- 1%

4. Test conducted with BITUTHENE® 4000 surface conditioner at minimum application temperature

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